

Installation Guide

Atec



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The English language is used for the original instructions.
Other languages are a translation of the original instructions.
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1 About documents and decals

1.1 Introduction

The following documents are available for this product:

- The Wiring diagrams that contain the wiring diagram for the heat pump intended for fault tracing and service. The Wiring diagrams are available for download as below.
- The User manual must handed over and gone through with the end customer. Supplied with the heat pump on delivery.
- Country specific instructions and forms are available where relevant. Supplied with the heat pump on delivery.
- Self-adhesive decals with translation text. Must be placed on the manufacturing plate in conjunction with installation. Supplied with the heat pump on delivery.

The Service instructions and Wiring diagrams are available for download here:

www.thermia.com/documents

1.2 Symbols in documents

The instructions contain different warning symbols, which, together with text, indicate to the user that there are risks involved with actions to be taken.

The symbols are displayed to the left of the text and three different symbols are used to indicate the degree of danger:

Danger



Indicates an immediate danger that leads to fatal or serious injury if necessary measures are not taken.

Warning



Risk of personal injury!

Indicates a possible danger that can lead to fatal or serious injury if necessary measures are not taken.

Caution



Risk of installation damage.

Indicates a possible hazard that can lead to item damage if necessary measures are not taken.

A fourth symbol is used to give practical information or tips on how to perform a procedure.



Information regarding making the handling of the installation easier or a possible operational technical disadvantage.

1.3 Symbols on decals

The following symbols can occur on decals on the different parts of the heat pump. Which symbols are used depends on the heat pump model.

1.3.1 General

-  Warning, danger!
-  Read the documentation provided.
-  Read the documentation provided.
-  Warning, hazardous electrical voltage!

-  Warning, hot surfaces!
-  Warning, moving parts!
-  Warning, risk of crushing injury!

1.3.2 Electrical components

- | | |
|---|--|
|  3 Outdoor unit |  406 Room sensor |
|  50 Outdoor sensor | or |
|  54 Hot water sensor |  62 |
|  55 Hot water top sensor |  408 EVU |
|  71 Flow guard |  417 Defrost sensor |
|  353 Drip tray | |
|  362 Shunt valve | |
|  304 Circulation pump | |
|  363 Exchange valve hot water | |
|  365 Supply line sensor | |
|  366 Return line sensor | |

Explanation

-  Component, ordinary delivery according to proposed system solutions
-  Component, accessories according to proposed system solutions

1.3.3 Pipe connections

-  Tap water
-  Heating system
-  Brine system
-  Defrosting tank
-  Expansion tank with safety valve, brine
-  Air bleeding
-  Temperature and pressure relief valve
-  Outdoor unit
-  Water heater

2 Transport, unpacking and setting-up

2.1 Transporting the heat pump

Caution



During transportation or lifting of the entire heat pump, the front panel must always be installed as it locks the other panels construction.

Caution



The heat pump must always be transported and stored in a dry area. Secure the heat pump so that it cannot tip over during transportation.

Caution



The heat pump must always be transported and stored standing and in a dry environment. If the heat pump is laid on the incorrect side it may become seriously damaged as the oil in the compressor can run out in the pressure pipe and therefore prevent normal function.

When transporting indoors to the installation location it may be necessary to place the heat pump on its back. The time that the heat pump is transported on its back should be as short as possible. After the heat pump has been lifted up again it must stand upright for at least an hour before commissioning.

2.2 Unpacking

2.2.1 Unpack the heat pump

1. Check that there is no transport damage.
2. Remove the packaging.

2.2.2 Delivery check

Check that the delivery contains the following components:

Quantity	Name
1	Heat pump
1	Control unit
1	Document set
1	Package (1 x shut-off valve with filter, 1 x outdoor sensor)

2.3 Positioning the Atec heat pump

The location of the outdoor unit is chosen so that neither the own living environment or adjoining properties are exposed to noise interference.

The device is, to advantage, placed in an environment with lush trees and shrubs with grass surface. Large hard asphalt surfaces and stone or brick walls around the heat pump should be avoided since they effectively reflect the sound.

Avoid locating the outdoor unit:

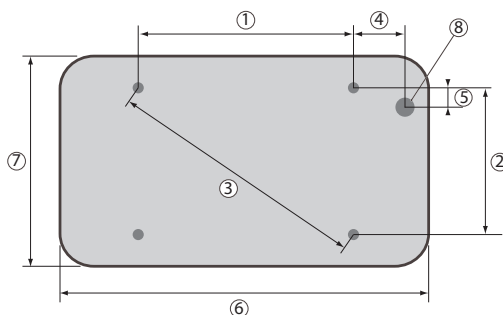
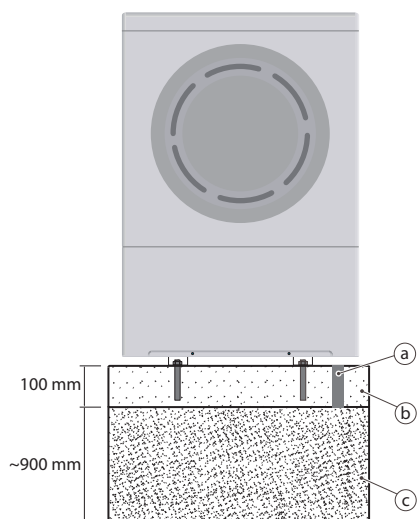
- close to windows or walls to bedrooms etc.
- facing nearby neighbours.
- in an inner corner of the building. It gives a very large effect on the direction of sound propagation.



Adhere to national regulations regarding noise interference.

2.3.1 Heat pump foundation

1. The heat pump must be positioned outdoors on a stable base that can take the total weight of the heat pump, see *Technical data*.
2. Secure all four mounting points on a stable base, for example a cast foundation.



Measurements	6-9 kW	11-13 kW	16-18 kW
1	450 mm	470 mm	710 mm
2	424 mm	480 mm	480 mm
3	618 mm	672 mm	857 mm
4	130 mm	190 mm	145 mm
5	61 mm	65 mm	65 mm
6	~1,000 mm	~1,200 mm	~1300 mm
7	~650 mm	~720 mm	~720 mm
8	Ø 65 mm	Ø 65 mm	Ø 65 mm

Position	Description
a	Drainage hole
b	Foundation
c	Gravel

Bolt size		
6-9 kW	11-13 kW	16-18 kW
M10 (4x)	M12 (4x)	M12 (4x)

Caution



A drip tray is installed with the purpose of gathering and draining away melt water during defrosting. Connect a hose or pipe along with a heat trace cable between the outlet of the drip tray and a drain or a free draining piece of ground. The heat cable must be connected to the terminal provided and is necessary to prevent ice blockage.

Caution



Check with a spirit level that the heat pump is installed horizontally.

Caution



Incorrect positioning of the heat pump risks reduction of performance.

Caution



The unit with water heater must be placed indoors, in an area with a floor drain.

Caution



The unit with water heater must be placed indoors, on a stable surface. The floor must be able to support the gross weight of the unit with filled water tank (see Technical data).



Avoid placing the heat pump near windows or walls to noise sensitive areas.



Ensure that there is sufficient distance to neighbouring properties so that they are not exposed to noise. Applicable local regulations must be followed.



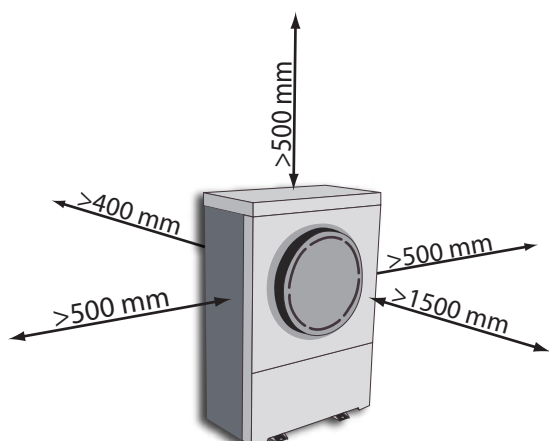
The heat pump should not be enclosed.



Keep the heat pump and its immediate area free of snow, ice, leaves etc.

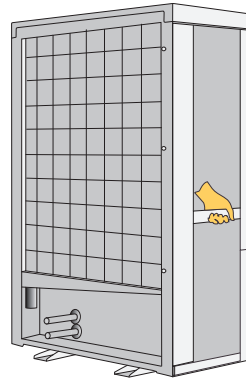
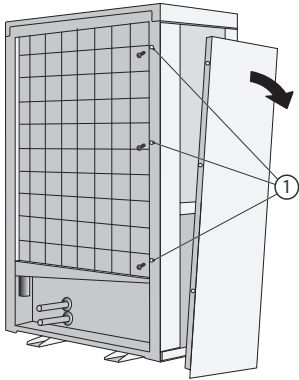


Remember that the heat pump must have a certain amount of space in order to function and for servicing. Otherwise there is a risk that the air will recirculate from exhaust to intake. Avoid this by following the dimensions given below.



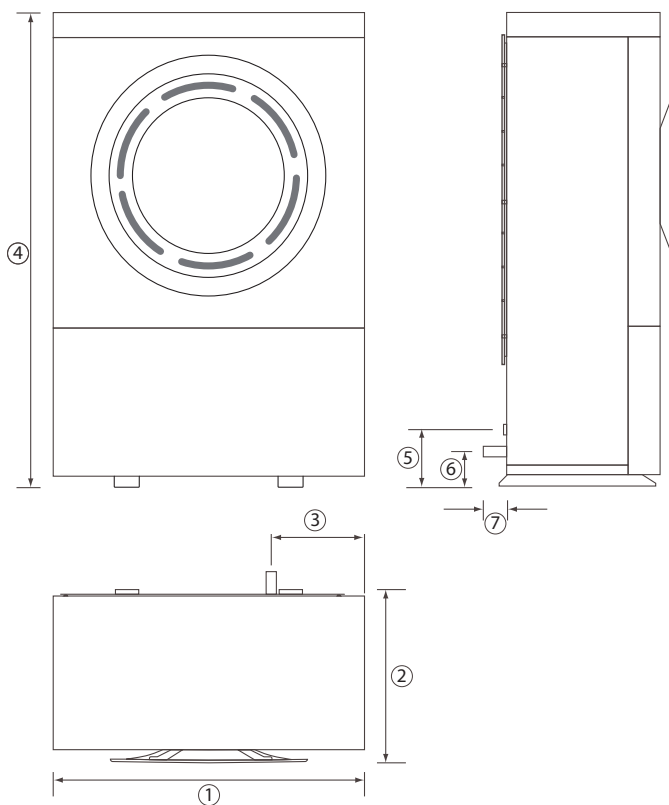
2.3.2 Lifting instructions

To lift the heat pump into position, unscrew the side plates by slackening off the screws (1). Then use the side members behind the side panels to lift and position the heat pump.



3 Heat pump data, dimensions and connections

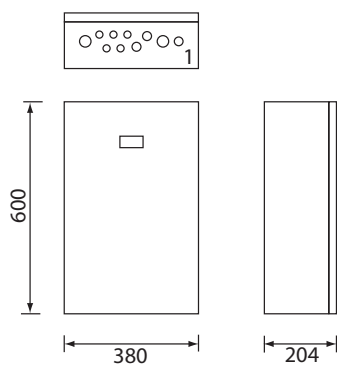
Atec



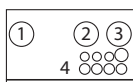
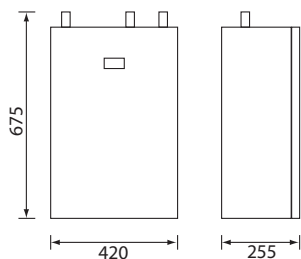
Position	Description	6-9 kW	11-13 kW	16-18 kW
1	Width	856 mm	1,016 mm	1,166 mm
2	Depth	510 mm	564 mm	570 mm
3	Distance from HP side to supply line pipe	251 mm	285 mm	366 mm
4	Height	1,272 mm	1,477 mm	1,557 mm
5	Height to supply line pipe, 28 mm Cu	155.5 mm		
6	Height to return line pipe, 28 mm Cu	96.5 mm		
7	Length max protruding pipe	30 mm		

Control unit Atec Standard

1. Lead-in for supply, sensor and communication cables

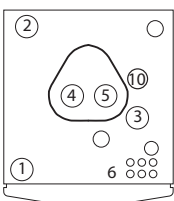
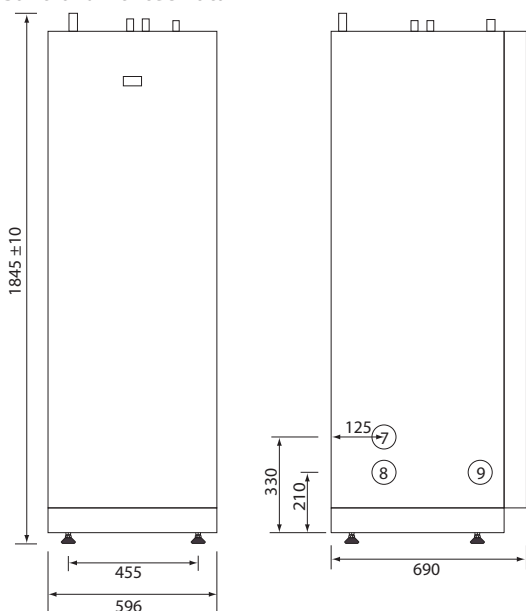


Control unit Atec Plus



1. Supply line for heating system, 28 mm Cu
2. Supply line to water heater, 28 mm Cu
3. Supply line from heat pump, 28 mm Cu
4. Lead-in for supply, sensor and communication cables

Control unit Atec Total



1. Supply line heating system, 28 mm Cu
 2. Return line heating system, 28 mm Cu
 3. Connection for bleed valve, 22 mm Cu
 4. Hot water line, 22 mm Cu
 5. Cold water line, 22 mm Cu
 6. Lead-in for supply, sensor and communication cables
 7. Supply or return line heat pump
 8. Supply or return line heat pump
 9. Extra knock-out
 10. Safety valve for temperature and pressure (only applies to certain models)
- Position 7 and 8 can be connected to either the left or right-hand side or at the bottom of the control unit.

4 Piping installation

Caution



Piping installation must be carried out in accordance with applicable local rules and regulations. The hot water tank must be equipped with an approved safety valve.

Caution



To prevent leaks, ensure that there are no stresses in the connecting pipes!

Caution



It is important that the heating system is bled after installation. Bleed valves must be installed where necessary.

Caution



There is a risk of the pipes to the heat pump freezing when water circulation through the heat pump stops when outdoor temperatures fall below freezing. Normally the integrated flow sensor gives an alarm if there is low flow (assumes that there is current to the heat pump), for example when the radiator pump has stopped. In the event of longer flow stops, for example in case of power failure or if the plant is **OFF**, there is however an obvious risk of freezing. By installing a stop cock on the inside of the house wall it is possible to drain the part of the system that goes out to the heat pump if necessary. Another way of ensuring against freezing is to install an intermediate exchanger indoors. In such cases one must use glycol intended for refrigerant applications in the circuit to the heat pump unit and an extra circulation pump, see System solution intermediate exchanger. Another option is to fill the heating system with anti-freeze.

Caution



Heating systems with closed expansion tanks must also be supplied with approved pressure gauges and safety valves.

Caution



Cold and hot water pipes and overflow pipes from safety valves must be made of heat resistant and corrosion-resistant material, e.g. copper. The safety valve overflow pipes must have an open connection to the drain and visibly flow into this in a frost-free environment.

Caution



The connecting pipe between the expansion tank and the safety valve must slope continuously upwards. A continuous upwards slope means that the pipe must not slope downwards from the horizontal at any point.



Ensure that the pipe installation is carried out in accordance with the dimensions and connection diagrams.



Configure the heat pump for the desired system solution in the SERVICE\ADD. HEATER\EXTERNAL ADDITION menu.

4.1 Water volume in heating system

In order to secure the defrosting of the outdoor unit, a minimum amount of water must be contained in the heating system. This is shown in the table below.

If the heating system itself holds the amount of water described in the table, a volume tank is not needed, but recommended.



If the amount of water in the heating system is not sufficient, Low Pressure alarms may occur.

Volume tank table	Unit	6 kW	9 kW	11 kW	13 kW	16 kW	18 kW
Min water volume in heating system. Atec Standard and Atec Plus	l	120	180	220	260	320	360
Min water volume in heating system. Atec Total	l	60	90	110	130	160	180

4.2 Minimum flow in the heating system

Make sure that the dimensioning of the piping in the heating system is sufficient to get the minimum flow presented below:

HP Size	6kW	9kW	11kW	13kW	16kW	18kW
l/min	7.9	11.5	14.5	16.7	19.8	23.7



Insufficient flow in the system may result in high pressure-, or low heat circulation flow alarms.

4.3 Safety valves

Warning



Radiator systems with a closed expansion tank must also be equipped with an approved manometer and safety valve, minimum DN 20, 1.5 bar opening pressure, or according to country specific requirements.

Warning



Cold and hot water pipes and overflow pipes from safety valves must be made of heat resistant and corrosion-resistant material, e.g. copper. The safety valve overflow pipes must have an open connection to the drain and visibly flow into this in a frost-free environment.

Warning



The connecting pipe between the expansion tank and the safety valve must slope continuously upwards. A continuous upwards slope means that the pipe must not slope downwards from the horizontal at any point.

4.4 Connection heating and hot water

4.4.1 Connect cold and hot water lines

1. Connect the cold water and hot water pipes with all the necessary components according to the connection diagram for the relevant system.

4.4.2 Connect the heating system supply and return lines

For information on how flexible hoses should be installed, see Flexible hoses.

1. Connect the supply pipe with a flexible hose connection and with all the necessary components.
2. Connect the return pipe with a flexible hose connection and with all the necessary components including a filter.
3. Insulate the supply and return lines.



For Atec use the following dimensions for supply and return pipes:

- | | |
|---|-------------------------------|
| 1 | Supply line 28 mm copper pipe |
| 2 | Return line 28 mm copper pipe |

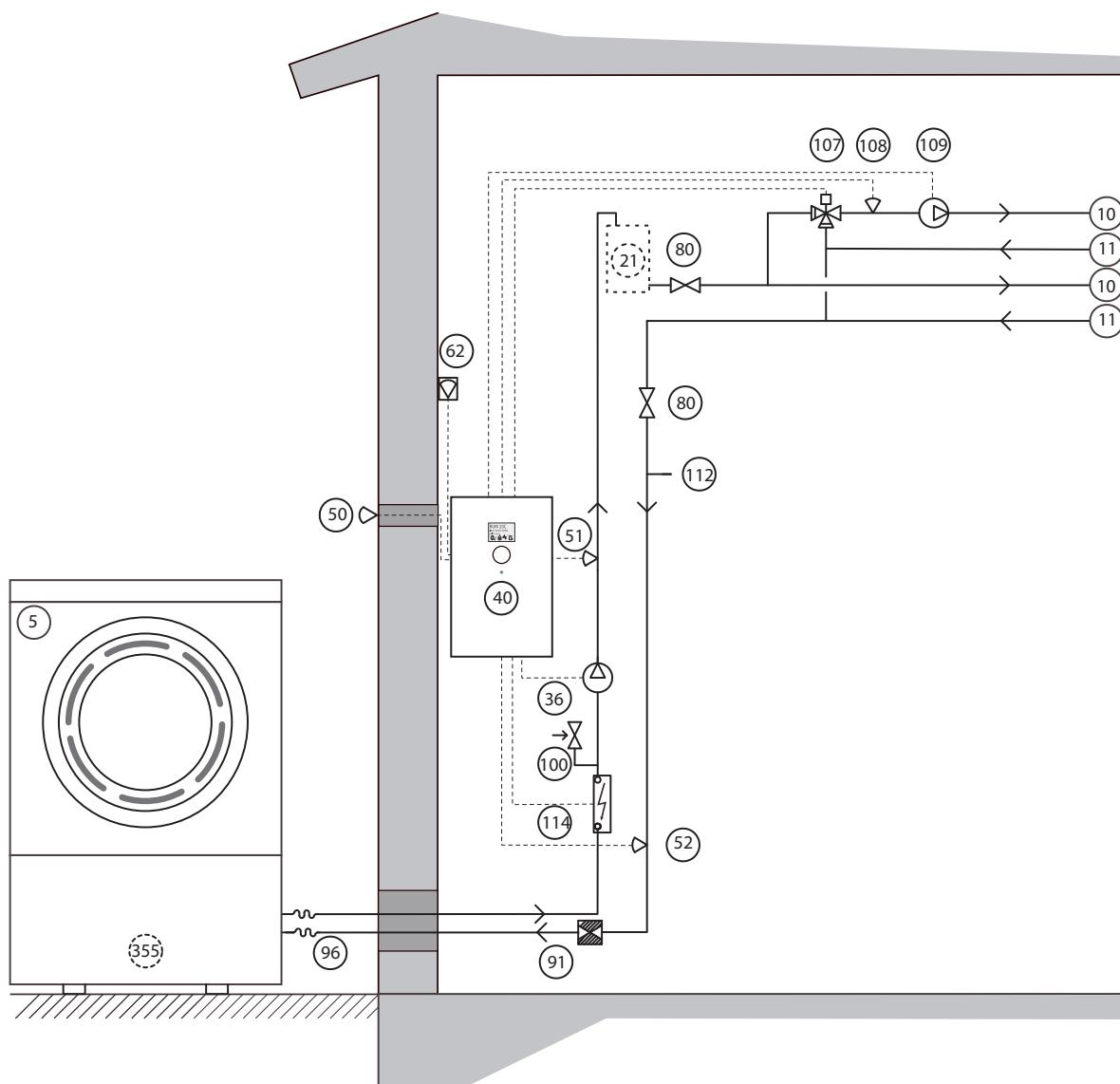
4.4.3 Atec System solution

System solution Atec Standard

Atec Standard includes the control module with supply and return line sensors. The heat pump produces only heat or cooling. Two heating circuits can be connected, one using a shunt. The shunt is controlled by the heat pump control system. The flow line temperature is controlled with reference to the outside temperature following a set heat curve. The additional heater starts automatically on demand.

Buffer tank is installed for equalisation of the temperature for the heating system and to guarantee sufficient energy when defrosting. The buffer tank volume must be 20 l/kW heat pump output (for systems without water heaters). Atec Standard does not contain a water heater. Water heater is available as an accessory for Atec Plus and is included in Atec Total.

For position explanations, see the chapter Symbol Key.



System solution Atec Plus

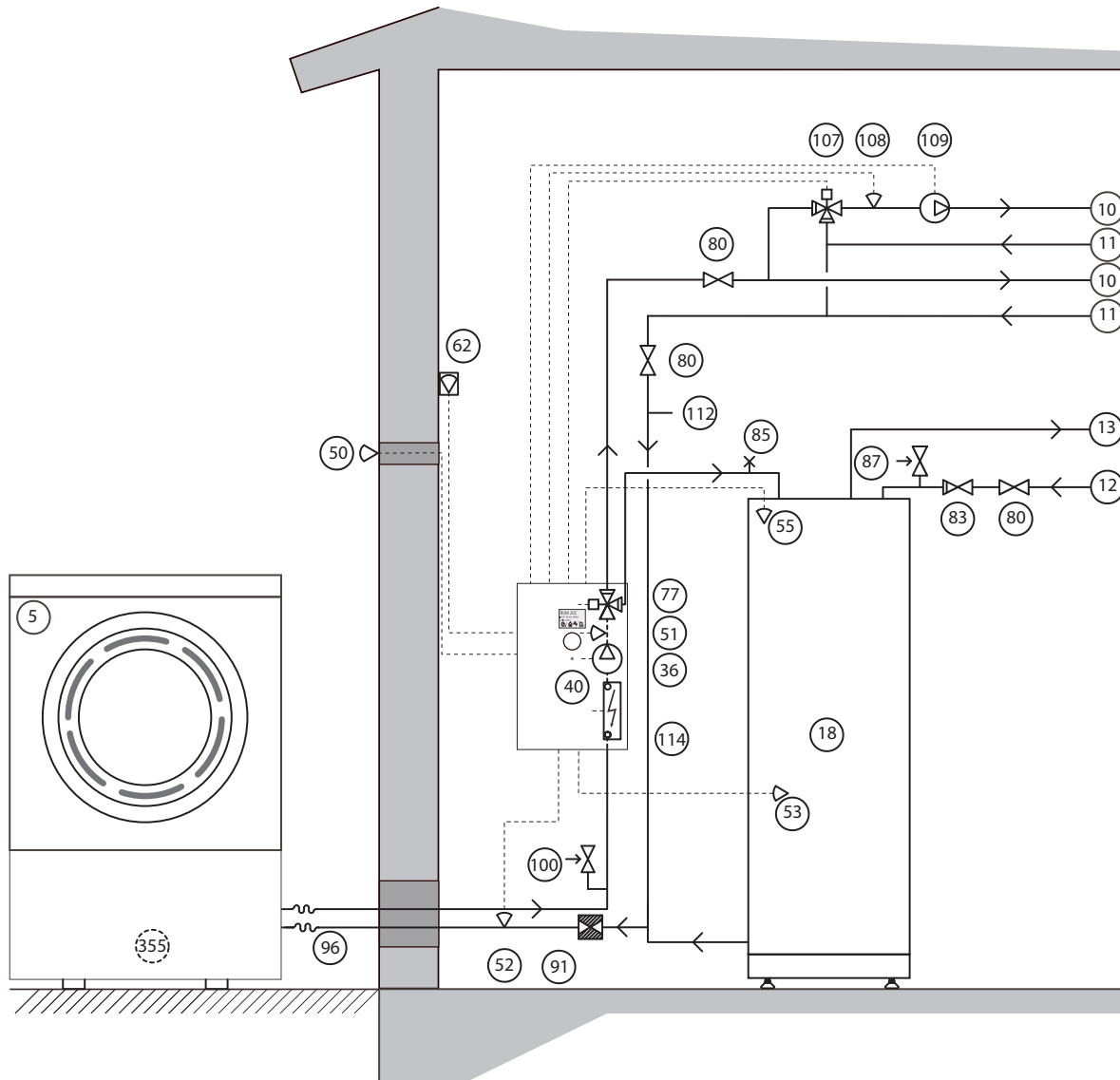
Atec Plus includes the control module with supply and return pipe sensors, circulation pump, 3-way valve and electric auxiliary heater. The heat pump produces heat, cooling and hot water.

Production of heating and hot water cannot occur at the same time because the exchange valve for heating and hot water is positioned after the heat pump and the auxiliary heater. Hot water production is prioritised ahead of heat and cooling. Two heating circuits can be connected, one using a shunt. The shunt is controlled by the heat pump control system.

The flow line temperature is controlled with reference to the outside temperature following a set heat curve. The additional heater starts automatically on demand. The auxiliary heater carries out peak heating charging (anti-legionella function) in those operating modes that permit auxiliary heat.

Buffer tank is installed for equalisation of the temperature for the heating system and to guarantee sufficient energy when defrosting. The buffer tank volume must be 10 l/kW heat pump output (for systems with water heaters). Water heater is available as an accessory.

For position explanations, see the chapter Symbol Key.



System solution Atec Total

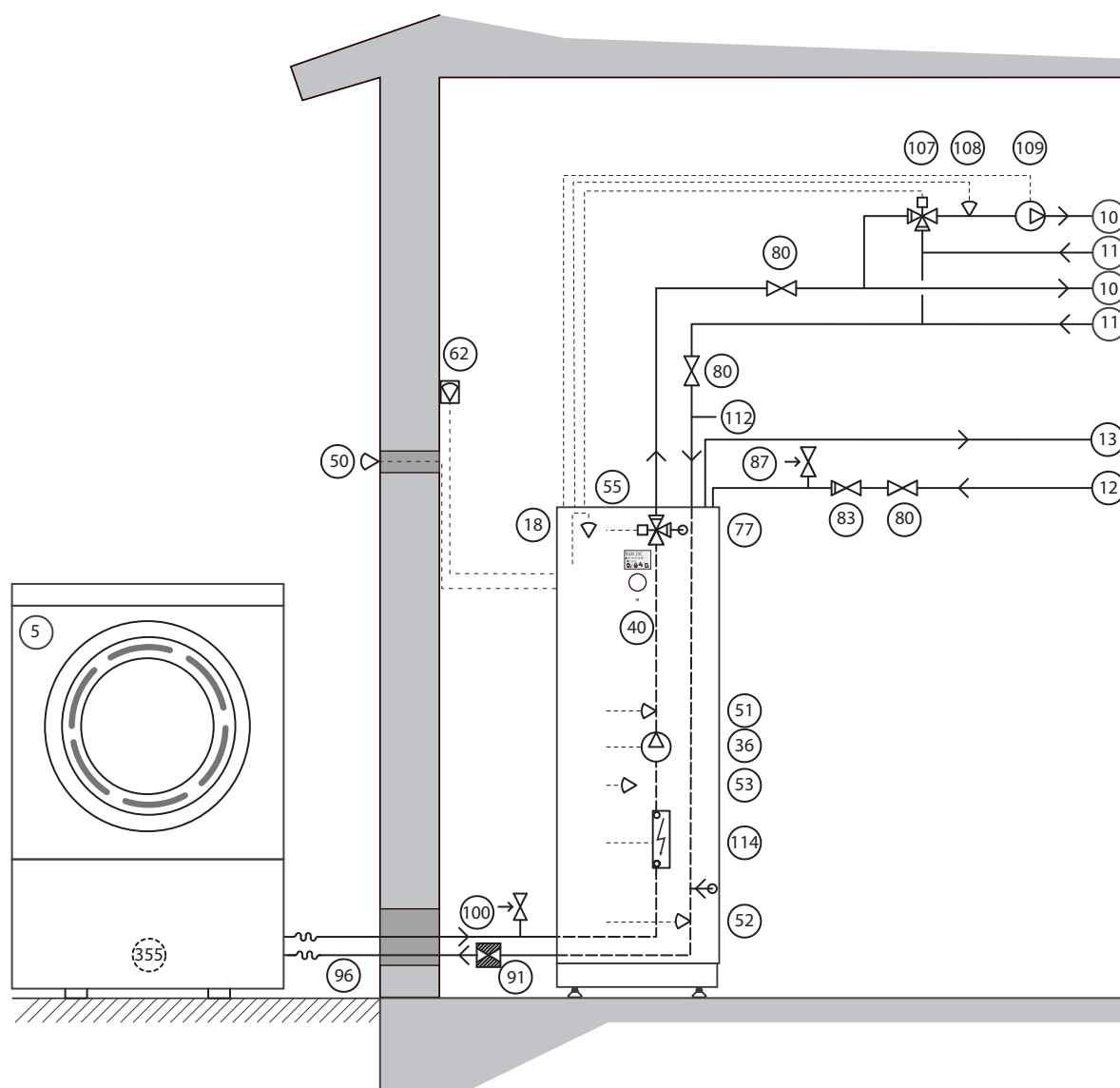
Atec Total includes the control module with supply and return pipe sensors, circulation pump, 3-way valve, electric auxiliary heater and water heater. The heat pump produces heat, cooling and hot water.

Production of heating and hot water cannot occur at the same time because the exchange valve for heating and hot water is positioned after the heat pump and the auxiliary heater. Hot water production is prioritised ahead of heat and cooling. Two heating circuits can be connected, one using a shunt. The shunt is controlled by the heat pump control system.

The flow line temperature is controlled with reference to the outside temperature following a set heat curve. The additional heater starts automatically on demand. The auxiliary heater carries out peak heating charging (anti-legionella function) in those operating modes that permit auxiliary heat.

Buffer tank is installed for equalisation of the temperature for the heating system and to guarantee sufficient energy when defrosting. The buffer tank volume must be 10 l/kW heat pump output (for systems with water heaters).

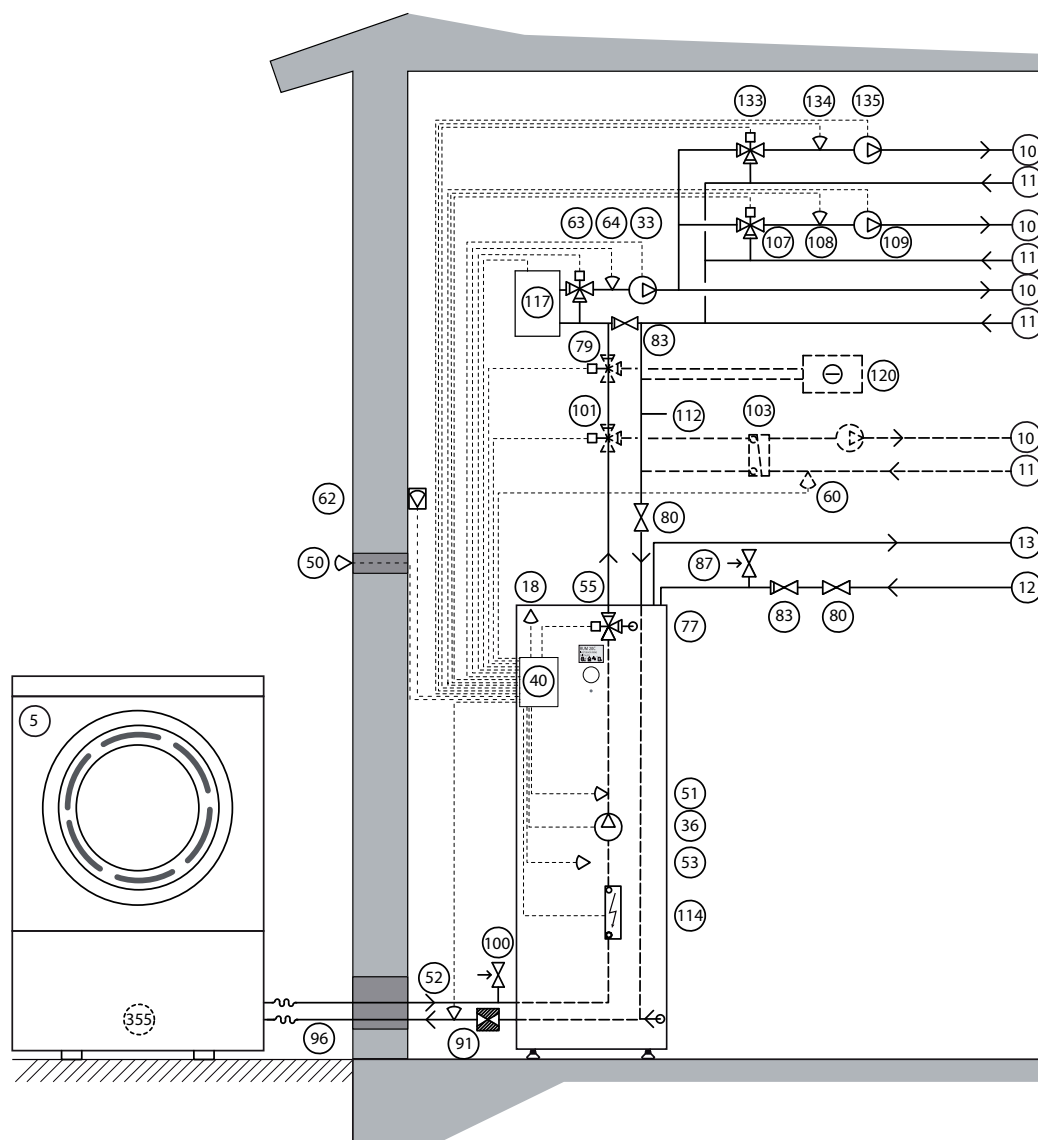
For position explanations, see the chapter Symbol Key.



System solution Atec Total with cooling and swimming pool

With two distribution circuits and external heater with a shunt. There are two accessories, a cooling system and a swimming pool.

For position explanations, see the chapter Symbol Key.



Symbol key

The following symbol key applies to all system solutions:

Pos	Description	Pos	Description
5	Heat pump unit	80	Shut-off valve
10	Supply line	83	Non-return valve
11	Return line	85	Air bleeding valve
12	Cold water	87	Safety valve (9 bar, WW)
13	Hot water	91	Dirt strainer with shut-off valve
18	Hot water storage tank	96	Flexible hose
21	Volume tank	100	Security valve (1.5 bar)
33	Circulation pump (shunt additional heater)	101	Reversing valve pool
36	System circulation pump	103	Pool heater exchanger
40	Control unit	107	Shunt valve (distribution circuit 1)
50	Outdoor sensor	108	Supply line sensor (distribution circuit 1)

Pos	Description	Pos	Description
51	System supply line sensor	109	Circulation pump (distribution circuit 1)
52	Return line sensor	112	Expansion vessel (hot gas)
53	Hot water starting sensor	114	Immersion heater
55	Hot water sensor top TWC	117	Additional heater
60	Sensor pool	120	Fan coil
62	Room sensor	133	Shunt valve (distribution circuit 2)
63	Shunt valve (additional heater)	134	Supply line sensor (distribution circuit 2)
64	Supply line sensor, mixing valve	135	Circulation pump (distribution circuit 2)
77	Diverting valve hot water	355	Connecting self-regulating heating cable for drip tray
79	Reversing valve cooling tank		

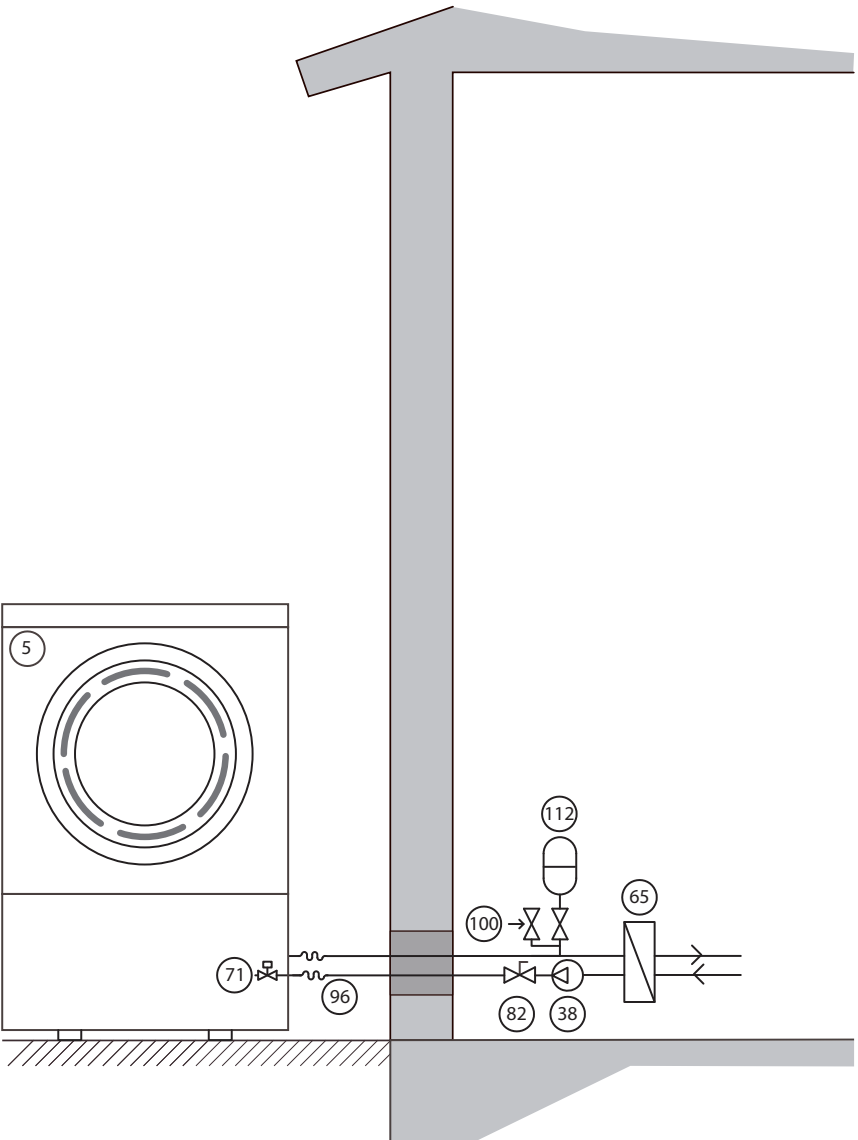
System solution intermediate exchanger

To safeguard against the pipes freezing an intermediate exchanger can be installed indoors. In such cases one must use glycol intended for refrigerant applications in the circuit to the heat pump unit and an extra circulation pump. Follow the supplier's instructions for mixing, but if none is given 35% is the lowest concentration recommended. To order and for more information about the intermediate exchanger and the circulation pump, contact Thermia.

Caution



No glycol mixtures may be used in systems with hot zinc dipped pipes or components.



Position	Name	Position	Name
5	Heat pump unit	82	Adjustment valve
38	Circulation pump	96	Flexible hose
65	Intermediate exchanger	100	Safety valve (1.5 bar)
71	Flow sensor	112	Expansion vessel, closed

4.5 Noise information

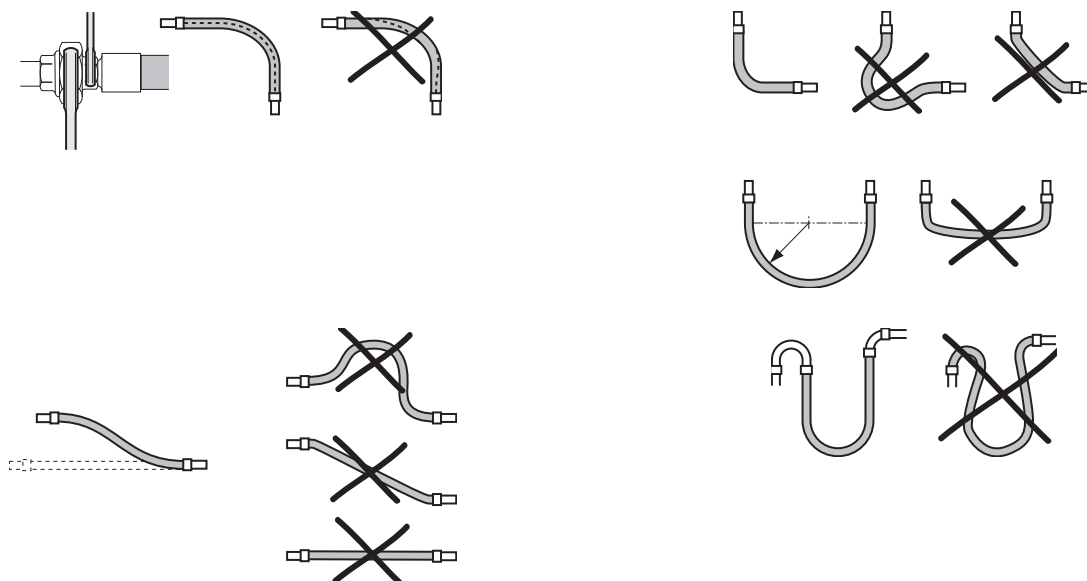
4.5.1 Installation of the heat pump

To prevent disturbing noise from the heat pump the following recommendations should be observed:

- In the event the heat pump is positioned on a vibration sensitive base, vibration dampers should be used. The vibration dampers must be correctly dimensioned with regard to the heat pump's weight so that static spring depression of at least 2 mm is obtained in all mounting components.
- Connection of the heat transfer fluid to the heat pump must be made using a flexible hose to prevent transmission of vibration to building construction and the pipe system, see Flexible hoses.
- Ensure that pipes at lead-ins are not lying against the walls.
- Ensure that the electrical supply cable does not provide a path for vibration because it is overstretched.

4.5.2 Flexible hoses

All pipes should be routed in such a way that vibrations cannot be transmitted from the heat pump through the piping and out into the building. This also applies to the expansion pipe. We recommend that flexible hoses are used for all pipe connections to avoid the transmission of vibrations. Flexible hoses are available to purchase as accessories. The figures below show how appropriate and inappropriate installations look using this type of hose.



5 Electrical Installation

Danger



Electrical voltage! The terminal blocks are live and can be highly dangerous due to the risk of electric shock. All power supplies must be isolated before electrical installation is started. The heat pump is connected internally at the factory, for this reason electrical installation consists mainly of the connection of the power supply.

Caution



Electrical installation may only be carried out by an authorized electrician and must follow applicable local and national regulations.

Caution



The electrical installation must be carried out using permanently routed cables. It must be possible to isolate the power supply using an all-pole circuit breaker with a minimum contact gap of 3 mm. (The maximum load for externally connected units is 2A).

5.1 Electrical connection points

This table shows how different electrical equipment should be connected. The positions in the table refers to the system solutions.

Pos	Description	Connect to
5	Heat pump unit	
33	Circulation pump (shunt additional heater)	101.2 and N
36	Circulation pump (system)	101.1 and N
40	Control unit	
50	Outdoor sensor	305 and Com
51	System supply line sensor	
52	Return line sensor	
53	Hot water starting sensor	
55	Hot water sensor top TWC	
60	Sensor pool	208.1 and Com
62	Room sensor	DC to 121.1 A to 121.3 Gnd to Gnd B to 121.5
63	Shunt valve (additional heater)	+102.3 -102.4 and N
64	Supply line sensor, mixing valve	118.2 and Com
79	Reversing valve cooling tank	M3.3 to L1:1 M3.6 to 101.6 M3.2 to N
101	Reversing valve pool	M3.3 to L1:1 M3.6 to 201.1 M3.2 to N
107	Shunt valve (distribution circuit 1)	+102.5 - 102.6 and N
108	Supply line sensor (distribution circuit 1)	118.3 and Com
109	Circulation pump (distribution circuit 1)	101.3 and N
114	Immersion heater	L1, L2 and N
117	Additional heater	101.4 and N 230Vac Alternative: Pot free relay max in 250V 8A connect in 101.8 out 101.16
120	Fan coil	
133	Shunt valve (distribution circuit 2)	+202.1 - 202.2 and N
134	Supply line sensor (distribution circuit 2)	208.3 and Com
135	Circulation pump (distribution circuit 2)	201.5 and N
355	Connecting self-regulating heating cable for draining	L1.1, PE and N

5.2 Control centre

5.2.1 Installation

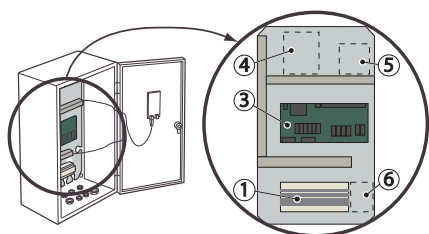
The control centre contains the necessary components for voltage supply, control systems and operation.

Caution



The control centre must be installed in a frost-free environment.

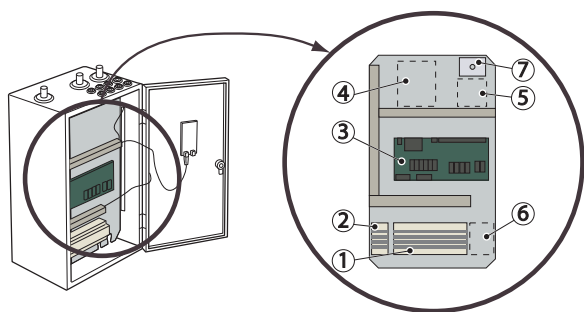
5.2.2 Atec Standard electrical components in the control centre



Position	Description
1	Terminal block
3	Hub card
4	Space for expansion card (accessory)
5	Space for communications card (accessory)
6	Space for terminal block for expansion card (accessory)

Fig. 1: Control unit

5.2.3 Atec Plus electrical components in the control centre



Position	Description
1	Terminal block
2	Terminal block for internal electrical auxiliary heater (IH)
3	Hub card
4	Space for expansion card (accessory)
5	Space for communications card (accessory)
6	Space for terminal block for expansion card (accessory)
7	Overheating protection

Fig. 2: Control unit

5.2.4 Atec Total electrical components in the control centre

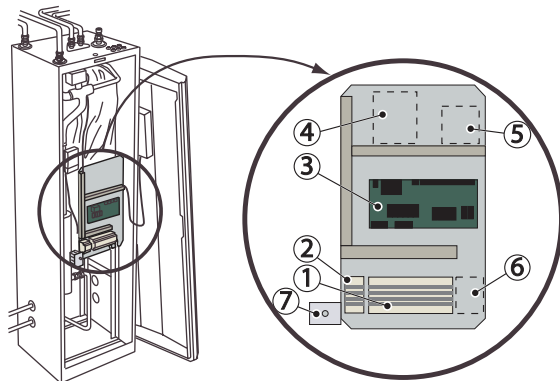


Fig. 3: Control unit

Position	Description
1	Terminal block
2	Terminal block for internal electrical auxiliary heater (IH)
3	Hub card
4	Space for expansion card (accessory)
5	Space for communications card (accessory)
6	Space for terminal block for expansion card (accessory)
7	Overheating protection

5.3 Electrical cabinet in heat pump

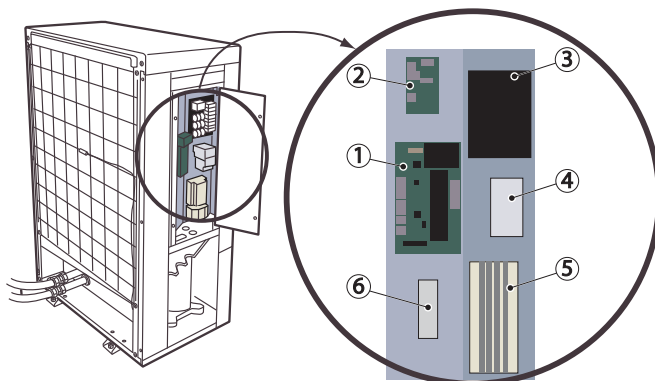


Fig. 4: Electrical cabinet

Position	Description
1	Heat pump card
2	Expansion valve card
3	Soft starter
4	Overcurrent protection
5	Terminal block
6	Capacitor (only for 230V 1N)

5.4 Cable connection



Laying electrical wiring can also cause noise so this installation must be carried out appropriately. An appropriate installation is where there is approximately 300 mm free cable between the heat pump and the building. It is inappropriate to bolt trunking between the heat pump and the wall. This is because vibrations can then be transmitted from the heat pump through the trunking to the walls of the house.

UV resistant cable must be used for outdoor power cables. Cable choice must follow applicable local and national regulations.

UV resistant, twinned pair data/telephone cable must be used for outdoor communication cables. The cable must be screened with the one end of the screening (it does not matter which end) earthed in a ground block. The cable section area must be a minimum of 0.25 mm².

When the power cable is connected to the terminal block a screwdriver is used to open the terminal block.

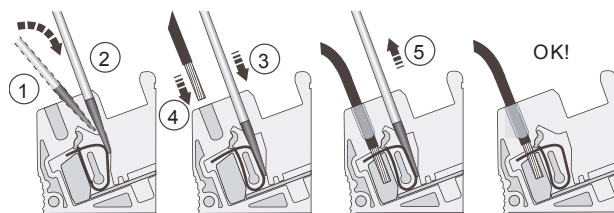


Fig. 5: Connecting power cable to terminal block.

1. Insert the screwdriver.
2. Straighten the screwdriver.
3. Push the screwdriver down to release the cable lock.
4. Insert the cable and hold it in place.
5. Pull the screwdriver out.
6. Check that the cable is secured by carefully pulling on the cable.

5.5 Connecting the outdoor sensor (5)

The outdoor sensor is connected by a two core cable. A maximum cable length of 50 m applies for a cross section of 0.75 mm². For greater lengths a cross section of 1.5 mm² is used, up to a maximum of 120 m. Then connect the sensor to the heat pump (outdoors) or the heat pump's control unit (indoors).

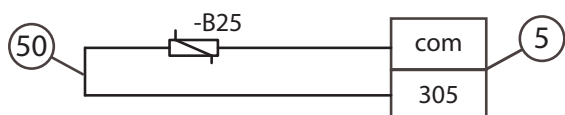


Fig. 6: Connect to the heat pump (outdoor)

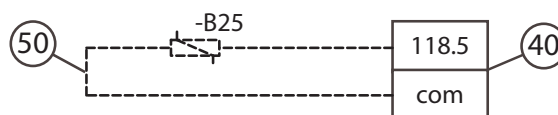


Fig. 7: Connect to the control unit (indoor)

5.6 Connecting supply and return pipe sensors

Atec Standard - no sensors connected upon delivery.
Atec Plus - supply line sensor connected upon delivery.
Atec Total - both sensors connected upon delivery.

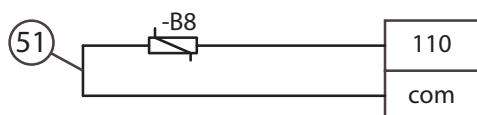


Fig. 8: Connect supply line sensor

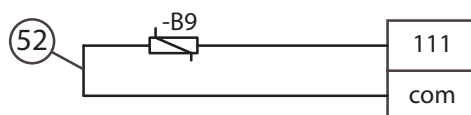


Fig. 9: Connect return line sensor

5.7 Connecting supply line sensor distribution circuit 1

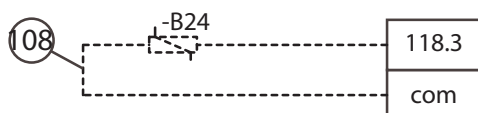


Fig. 10: Connect supply line sensor distribution circuit 1

5.8 Connecting sensors to external water heater

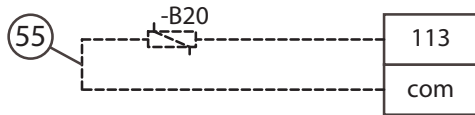


Fig. 11: Connect hot water sensor top

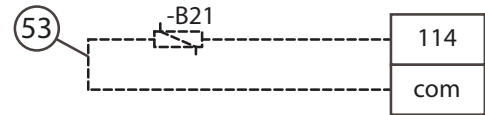


Fig. 12: Connect hot water sensor start

5.9 Connecting room sensor

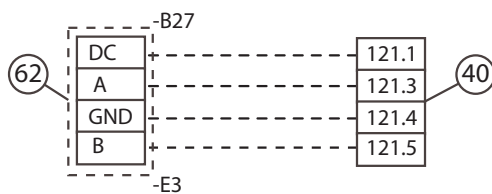


Fig. 13: Connect room sensor

5.10 Connecting system circulation pump

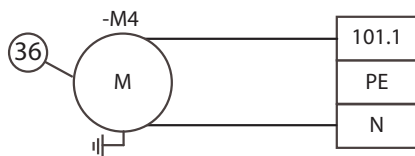


Fig. 14: Connect system circulation pump

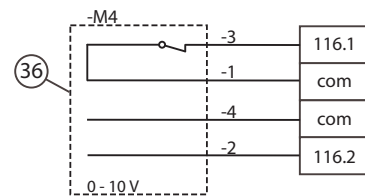


Fig. 15: Connect control signal to circulation pump with variable speed

5.11 Connecting circulation pump, distribution circuit 1

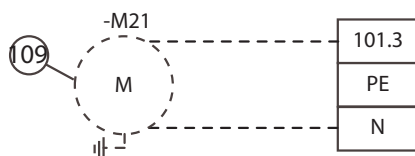


Fig. 16: Connect circulation pump distribution circuit 1

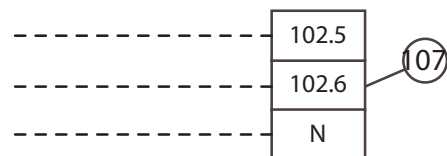


Fig. 17: Connect circulation pump distribution circuit 1 230VAC

5.12 Connecting heating cable drip tray

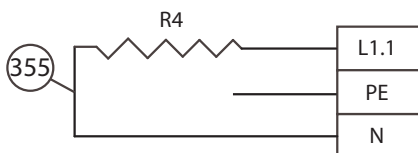


Fig. 18: Connect the electrical drip tray cable

5.13 Connecting the communication cable

UV-resistant twisted pair data /telephone cable for outdoor use.
Screened cable with the screened connection at the end of the earth terminal.
Maximum cable length is 30 metre.

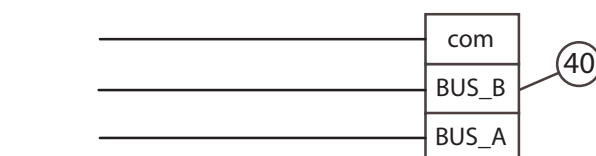
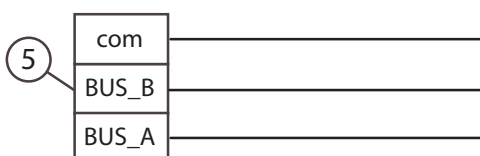


Fig. 19: Connect to the heat pump (outdoor)

Fig. 20: Connect to the control unit (indoor)

5.14 Connecting the power supply

Connect power cable to heat pump unit and to terminal block in control centre as below.

Danger



Electrical current! The power cable may only be connected to the terminal block intended for this purpose.
No other terminal blocks may be used!

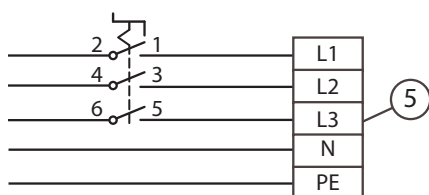


Fig. 21: Connect 400V 3-N

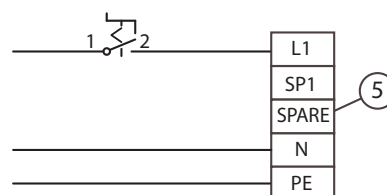


Fig. 22: Alternative connect 230V 1-N

5.15 Connecting the immersion heater cable

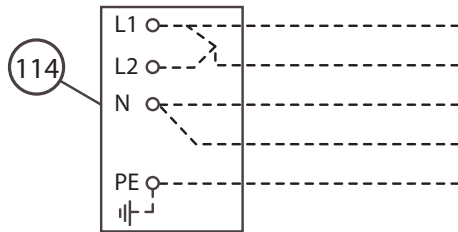


Fig. 23: Connect immersion heater cable

5.16 Connecting the swimming pool sensor

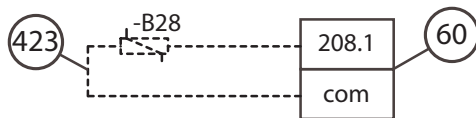


Fig. 24: Connect swimming pool sensor

5.17 Connecting the distribution circuit 2 sensor

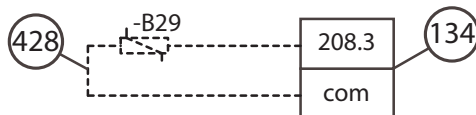


Fig. 25: Connect sensor distribution circuit 2

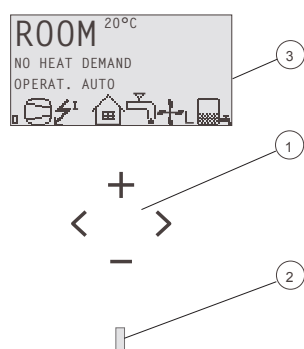
6 Menu information

The heat pump has an integrated control system which automatically calculates the heat demand in the house to ensure that the correct amount of heat is produced and emitted when necessary.

The control system is operated using a keypad and information is shown in a display and by an indicator.



The information in the display and menus will vary depending heat pump model and connected accessories.



- 1 Keypad
- 2 Indicator
- 3 Display

7 INFORMATION menu

7.1 Menu overview

- OPERAT.
- HEATING
- DISTRIBUTION CIRCUIT1
- DISTRIBUTION CIRCUIT2
- HOT WATER
- COOLING
- POOL
- BUFFER TANK
- OP. DATA
- OPERAT. TIME
- DEFROST
- CALENDAR
 - CLOCK
 - HOT WATER
 - EVU
 - SILENT MODE
 - TEMP.REDUCTION
 - CONCRETE DRYING PROG.
- ALARM
- LANGUAGE

7.2 Sub-menu OPERAT.

Menu selection	Meaning	Factory setting
 (OFF)	The installation is fully switched off. This mode is also used to acknowledge certain alarms. CANCEL = starting point, no changes made. To select OFF as operating mode, press the minus sign once to scroll down one step and press the right arrow once.	-
AUTO	Automatic operation with both heat pump and auxiliary heater permitted. If the number of power stages for auxiliary heating are set to zero (SERVICE -> AUX. HEATER -> MAX STEP) only AUTO or OFF can be selected as operating mode.	-
COMPRESSOR HEAT PUMP	The control system is controlled so that only the heat pump unit (compressor) is allowed to operate. In this operating mode peak heating charging (anti-legionella function) of the hot water will not run because the auxiliary heater is not used. Operation with only compressor permitted.  No peak heating charging (anti-legionella function) with only heat pump operation.	-
AUX. HEATER	Operation with only auxiliary heater permitted.	-
HOT WATER	Operation with heat pump for hot water production and auxiliary heater during peak heating charging (anti-legionella function).	-
MANUAL TEST	Only displayed when the value for MANUAL TEST is set to 2 in the SERVICE menu. Outputs that control components are activated manually.	-

7.3 HEATING

Parameter	Meaning
CURVE	Calculated supply temperature at 0°C outdoor temperature. Shown as a graphic curve. The curve will be limited by the set values of MIN and MAX. Factory setting: 40°C (for under floor heating 30°C), range: 22°C – 56°C
MIN	Minimum permitted supply temperature, if the temperature for heat stop has been reached and the heat pump has stopped. Factory setting: 10°C, range: 10°C – 50°C
MAX	Maximum calculated setpoint value of the supply temperature. Factory setting: 55°C (for under floor heating 45°C), range: 40°C – 85°C
CURVE +5	Local increase or reduction of CURVE at an outdoor temperature of +5°C. Shown in the graph for CURVE. Factory setting: 0°C, range: -5°C – 5°C
CURVE 0	Local increase or reduction of CURVE at an outdoor temperature of 0°C. Shown in the graph for CURVE. Factory setting: 0°C, range: -5°C – 5°C
CURVE -5	Local increase or reduction of CURVE at an outdoor temperature of -5°C. Shown in the graph for CURVE. Factory setting: 0°C, range: -5°C – 5°C
HEAT STOP	Maximum outdoor temperature when heat production is permitted. If HEAT STOP applies, the outdoor temperature must drop 3°C below the setting before HEAT STOP stops. Factory setting: 17°C, range: 0°C – COOLINGMODE ACTIVE -3°C
CONSTANT TEMP	The temperature that the shunt wishes to retrieve from the buffer tank and distribute to the house. Only applies when the buffer tank is activated and with shunt group connected. Factory setting: 18°C, range: 10°C – 30°C
SETBACK TEMP	The temperature that will apply at temperature setback. Temperature setback is activated via the calendar function. When the function is activated ROOM is the temperature that is set here. Factory setting: 18°C, range: 10°C – 30°C
ROOM FACTOR	Only displayed if an accessory Room temperature sensor is installed. Determines how great an impact the room temperature is to have when calculating the supply temperature. For under floor heating it is recommended that ROOM FACTOR is set to 1, 2 or 3. For radiator heating it is recommended that ROOM FACTOR is set to 2, 3 or 4. Impact: 0 = no impact, 4 = large impact. Factory setting: 2, range: 0 – 4

7.4 DISTRIBUTION CIRCUIT 1 - 2

Only appears if the function is activated in menu SERVICE -> INSTALLATION - SYSTEM -> SHUNT GROUP.

Parameter	Meaning
CURVE	Calculated supply temperature at 0°C outdoor temperature. Shown as a graphic curve. The curve will be limited by the set values of MIN and MAX. Factory setting: 40°C (for under floor heating 30°C), range: 22°C – 56°C
MIN	Minimum permitted supply temperature, if the temperature for heat stop has been reached and the heat pump has stopped. Factory setting: 10°C, range: 10°C – 50°C
MAX	Maximum calculated setpoint value of the supply temperature. Factory setting: 55°C (for under floor heating 45°C), range: 15°C – 70°C
CURVE +5	Local increase or reduction of CURVE at an outdoor temperature of +5°C. Shown in the graph for CURVE. Factory setting: 0°C, range: -5°C – 5°C
CURVE 0	Local increase or reduction of CURVE at an outdoor temperature of 0°C. Shown in the graph for CURVE. Factory setting: 0°C, range: -5°C – 5°C
CURVE -5	Local increase or reduction of CURVE at an outdoor temperature of -5°C. Shown in the graph for CURVE. Factory setting: 0°C, range: -5°C – 5°C
DURING COOLING	During production of cooling the shunt group can be adjusted. Factory setting: AUTO, range: AUTO, OPEN, CLOSED

Parameter	Meaning
CONSTANT TEMP	Controlling the shunt group against a constant temperature is an alternative to the control using a heat curve given above. Control using constant temperature is selected using the parameter CONSTANT TEMP in the Service menu. Factory setting: 18°C, range: 10°C – 30°C
SETBACK TEMP	The temperature the shunt group works with when the temperature reduction is activated in the menu CALENDAR. Factory setting: 18°C, range: 10°C – 30°C

7.5 HOT WATER

Parameter	Meaning
HOT WATER	Allows hot water production. Factory setting:  range:  – ON
TOP-UP	Forced hot water production with compressor and aux. heater. Factory setting:  range:  – ON

7.6 COOLING

Parameter	Meaning
COOLING	Allows production of cooling. Factory setting:  range:  – ON
START	Temperature on the return sensor for start of cooling production. Factory setting: 25°C, range: STOP + 5°C – MAX START TEMP
STOP	Temperature on the supply line sensor for stop of cooling production. Factory setting: 16°C, range: MIN STOP – START - 5°C
COOLINGMODE ACTIVE	With stated or higher outdoor temperatures cooling production is permitted. Factory setting: 25°C, range: HEAT STOP + 3°C – 50°C

7.7 POOL

Only appears if the function is activated in menu SERVICE -> INSTALLATION - SYSTEM -> POOL.

Parameter	Meaning
POOL TEMP	Temperature from separate pool sensor where the heat production for the pool is stopped. Factory setting: 20°C, range:  5°C – 40°C
POOL HYSTERESIS	When the temperature in the pool falls below the value of POOL TEMP minus the value of POOL HYSTERESIS the production of heating for the pool is started. Factory setting: 2°C, range: 1°C – 10°C

7.8 BUFFER TANK

The menu only appears if the function is activated in menu SERVICE -> INSTALLATION - SYSTEM -> BUFFER TANK.

Parameter	Meaning
TANK TEMP	Indicates desired temperature for buffer tank. The temperature is controlled dependent on the selection made in the Service menu. Standard setting is AUTO if at least one circuit is set to be controlled by the option HEAT CURVE IN SERVICE -> BUFFER TANK, and that all configured circuits out from the tank are shunted (i.e. not open circuits). AUTO means that the temperature in the tank follows the settings for the heat curve. At CONFIGURATION = TANK CONTROL and all configured circuits are set to shunt at constant temperatures, the lowest of the temperatures calculated by the system as a standard setting is set. AUTO mode is not available in this selection. Factory setting: AUTO, range: AUTO, 20°C – 55°C
OVERCHARGE	The temperature of the buffer tank can be raised so that it exceeds the heat curve temperature. Can only be used when TANK TEMP = AUTO. Factory setting: 0°C, range: 0°C – 5°C
TOPH. TANK	Activate high temperature mode when the external auxiliary heater is selected. The external auxiliary heater will heat the tank to the highest permitted tank temperature. Factory setting:  range:  – ON
RED. TANK TEMP	The function permits a reduction of the temperature in the tank when the temperature reduction is set to active in the CALENDAR menu. The temperature that is set in the tank is calculated by the system when the function has been activated. The function is only active at CONFIGURATION = TANK CONTROL and all configured circuits are set to shunt at constant temperatures. Factory setting:  range:  – ON

7.9 OP. DATA

Parameter	Meaning
OUTD	Shows the temperature on the outdoor sensor.
ROOM	Shows the temperature on the room sensor.
SUPPLY LINE	Shows the temperature on the supply line sensor. The calculated supply temperature to the heating system group is within brackets.
RETURN LINE	Shows the temperature on the return line sensor. The stop temperature, MAX RETURN is within brackets.
SYSTEM SUPPLY	Displays the temperature of the system supply line sensor at the buffer tank system or if the external auxiliary heater is activated.
DISTRIBUTION CIRCUIT 1	Shows the temperature on the distr. cir. 1 sensor. The calculated supply temperature for the shunt group is within brackets.
DISTRIBUTION CIRCUIT 2	Shows the temperature on the distr. cir. 2 sensor. The calculated supply temperature for the shunt group is within brackets.
BUFFER TANK	Shows the temperature on the sensor for the buffer tank.
HOT WATER	Displays the temperature on the hot water sensor on the condition that hot water production is permitted.
INTEGRAL	Shows the actual calculated value for the integral.
REFR 1	Shows the temperature at refrigerant sensor 1.
REFR 2	Shows the temperature at refrigerant sensor 2.
POOL	Displays the temperature on the pool sensor on the condition that pool operation is permitted.
CURRENT	Displays the current consumption in Amperes. The set value for MAX CURRENT is shown in brackets. Only appears if CURRENT LIMITER is selected in the Service menu.
DISCH. PIPE	Shows the temperature at the discharge pipe sensor.
SUCTION GAS	Shows the temperature of the suction gas.
EVAP. PRESSURE	Shows the pressure of the suction gas pipe. Measured in bar atmospheric pressure, bar (a).
DEFR SENSOR	Shows the temperature of the defrost sensor.

7.10 OPERAT. TIME

Parameter	Meaning
COMPRESSOR	Operating time for compressor.
COMPRESSOR SL	Operating time for compressor SLAVE.
HEATING	Operating time for heating.
COOLING	Operating time for cooling.
HOT WATER	Operating time for hot water with compressor.
AUX. HEAT 1	OPERAT. TIME AUX. HEATER 1.
AUX. HEAT 2	OPERAT. TIME AUX. HEATER 2.
AUX. HEAT 3	OPERAT. TIME AUX. HEATER 3.
EXT.AUX.HEATER	Operating time external auxiliary heater.

7.11 DEFROST

Parameter	Meaning
DEFROSTS	Total number of defrosts carried out.
BETW. 2 DEFR	The operating time of the compressor in minutes between the two last defrosts.
TIME LAST DEFR	The operating time of the compressor in minutes since last defrost.
DEFROST CURVE	Used to change the angle of the defrost curve using + or - (Change the start temperature for defrost). Factory setting: -7°C, range: -10°C – -4°C
MANUAL DEFR	Used to perform a manual defrost. Started using + or -. Factory setting: 0, range: 0 – 1

7.12 CALENDAR

Parameter	Meaning
CLOCK	Indicate day's date and time. Used in the calendar function and in the log at the alarm. DATE: day-month-year, example: 01-jan-2011 CLOCK: hours:minutes, example: 20:30
HOT WATER	To block hot water production. Up to eight calendar settings can be defined. Under CALENDAR SETTING, first select the menu TIME FUNCTION if blocking should be over a continuous time period (DATE) or be recurring (DAYS / WEEK). Then start and stop times are selected in the TIME SETTING menu.
EVU	EVU stops the heat pump and is a function that is used in certain countries to control electrical consumption. Up to eight calendar settings can be defined Under CALENDAR SETTING, first select the menu TIME FUNCTION if stop should be over a continuous time period (DATE) or be recurring (DAYS / WEEK). Then start and stop times are selected in the TIME SETTING menu.
SILENT MODE	Function where the noise level of the heat pump fan is reduced. Up to eight calendar settings can be defined. Under CALENDAR SETTING first select the menu TIME FUNCTION if reduction should be over a continuous time period (DATE) or be recurring (DAYS / WEEK). Then start and stop times are selected in the TIME SETTING menu.
TEMP. REDUCTION	Function for reduction of temperatures. The new setpoints are those values that are stated for heat curve, shunt groups and buffer tank in the information menu. Up to eight calendar settings can be defined. Under CALENDAR SETTING first select the menu TIME FUNCTION if reduction should be over a continuous time period (DATE) or be recurring (DAYS / WEEK). Then start and stop times are selected in the TIME SETTING menu.
CONCRETE DRYING PROG.	See description in the section Concrete drying.

7.13 Sub-menu LANGUAGE

Menu selection
SVENSKA
ENGLISH
DEUTSCH
NEDERLANDS
FRANÇAIS
ESPAÑOL
ITALIANO
NORSK
DANSK
SUOMI
EESTI
POLSKI
ČEŠTINA

7.14 ALARM

Parameter	Meaning
NAME ALARM	Displays information about up to 10 alarms and alarm times. NAME: Name of the alarm, example: AUX. HEATER TIME: hours:minutes, example 20:45 DATE: day-month-year, example 13-jan-11

8 SERVICE menu

8.1 Menu overview



To be able to chose a specific function, the sensor for that function must be connected.

- HOT WATER
- HEATING
- COOLING
- AUX. HEATER
- MANUAL TEST
- INSTALLATION
 - SYSTEM
 - HEAT SOURCE
 - POOL
 - DISTRIBUTION CIRCUIT 1-2
 - BUFFER TANK
 - OPTIMUM
 - CURRENT LIMITER
 - START UP CHECK
 - SERVICE TIME
 - FACTORY SET
 - RESET OPER. TIME
 - SENSOR CALIBRATION
 - VERSION
 - LOG TIME
- DEFROST
- OPTIMUM
- BUFFER TANK

8.2 HOT WATER

Parameter	Meaning
START	Start temperature for hot water production. Shows the actual weighted hot water temperature and the value within brackets indicates the start temperature. (⏻ = no hot water production) Factory setting: 40°C, range: ⏻ 30°C – 55°C
HOT WATER TIME	Time for hot water production during combined hot water demand and heating or cooling demand, in minutes. Factory setting: 20M, range: 5M – 40M
TOPH. INTERVAL	Time interval between peak heating chargings (anti-legionella function) in days. Operating mode that permits auxiliary heater must be selected. Factory setting: 7D, (range: ⏻ 1D – 90D
TOPH. TIME	Time in hours that the legionella demand is to be fulfilled for peak heating charging to be considered complete. Factory setting: ⏻, range: ⏻ 1H – 10H
TOPH. STOP	Stop temperature for peak heat charging. Operating mode that permits auxiliary heater must be selected. Factory setting: 60°C, range: 50°C – 65°C
INFL. H.W SENSOR.	Hot water sensor's influence compared with the peak sensor's at start of water heating. Factory setting: 65%, range: 0% – 100%

Parameter	Meaning
TOPH SENSOR	Shows the actual temperature at the top of the water heater provided that this sensor is engaged.
HOT WATER SENSOR	Shows the actual temperature approx 1/3 from the bottom of the hot water sensor.

8.3 HEATING

Parameter	Meaning
INTEGRAL A1	The integral's value (in degree minutes) for starting the heat pump. See Integral for more information. Factory setting: -60 min, range: -250°min – -5°min
HEATING TIME	When the heat pump must alternate between different demands for example heating, hot water, pool heating and cooling, heating will be produced longest according to the set number of minutes. Factory setting: 20M, range: 5M – 40M
HYSTERESIS	If the difference between the actual supply temperature and the calculated supply temperature is too great either the integral value is set to start value A1 (the heat pump starts) or the value is set to 0 (stops the heat pump). Factory setting: 12°C, range: 1°C – 15°C
MAX RETURN	Stop temperature at high return from the heating system. Factory setting: 55°C, range: 30°C – 70°C
START INTERVAL	Minimum time interval between two heat pump starts in minutes. Factory setting: 20M, range: 10M – 30M
OUTDOOR STOP	Lowest outdoor temperature when the outdoor sensor stops the compressor and heating or hot water are instead produced by the auxiliary heater. Operating mode that permits auxiliary heater must be selected. Factory setting: -20°C, range: -20°C – -1°C
FACTOR HP	Activation of room sensor function for blocking or resetting of the integral calculation. Factory setting:  , range:  – ON
RS HYST.LOW	Integral calculation is blocked if the temperature of the room sensor exceeds the setpoint value minus RS HYST.LOW. Factory setting: 1°C, range: 0°C, 5°C – 5°C
RS HYST.HIGH	Integral calculation is reset and the heat pump stops if the temperature of the room sensor exceeds the setpoint value plus RS HYST.HIGH. Factory setting: 1°C, range: 0°C – 5°C

8.4 COOLING

Parameter	Meaning
COOLING	Activates the cooling function. Factory setting:  , range:  ACTIVE COOLING, INTEGRATED IN HP
COOLING TIME	When the heat pump must alternate between different demands for example heating, hot water, pool heating and cooling, cooling will be produced longest according to the set number of minutes. Factory setting: 20M, range: 5M – 40M
MAX START TEMP	Highest settable temperature for START parameter in INFORMATION -> COOLING. Factory setting: 30°C, range: COOLING->START – 55°C
MIN STOP TEMP	Lowest settable temperature for STOP parameter in INFORMATION -> COOLING. Factory setting: 16°C, range: 5°C – COOLING->STOP
ROOM SENSOR	Activation of room sensor function for influencing cooling production. Factory setting:  , range:  – ON
COOL.HYST.RS LOW	Compressor is stopped if the temperature from the room sensors falls below the desired temperature minus COOL.HYST.RS LOW
COOL.HYST.RS HIGH	Compressor is not permitted to start if the criteria are not met.

8.5 AUX. HEATER

Parameter	Meaning
MAX STEP	Maximum number of permitted steps for auxiliary heating.  = no auxiliary heating permitted (Means that only AUTO, HEAT PUMP or [SYMBOL] can be selected and that no anti-legionella operation is possible.) P = the potential free output controls an immersion heater connected before the hot water reversing valve and not an external auxiliary heater as normal. Factory setting:  range:  - 5, P
INTEGRAL A2	Two conditions must be fulfilled in order to start the auxiliary heater: the integral's value to start must be less than integral A2, and the supply temperature must be 2°C lower than the calculated temperature. See Integral for more information. Factory setting: -600°min, range: -990°min - A1 - 10°min
HYSTERESIS	If the difference between the actual supply temperature and the calculated supply temperature is too great (see Important parameters), either the integral value is set to start value A2 (starts the auxiliary heater) or to 0 (stops the auxiliary heater). Factory setting: 20°C, range: 5°C - 30°C
MAX CURRENT	Refers to main fuse in the unit, in amperes. An expansion card must be connected for current measurement. Factory setting: 20A, range: 16A - 35A
HOT WATER STOP	Stop temperature for hot water during AUX. HEATER. The value is read off by the hot water sensor. Factory setting: 60°C, range: 50°C - 65°C
START DELAY	Gives the time that the start of the auxiliary heater is delayed after a temperature reduction or EVU stop. Factory setting: 30M, range: 0M - 120M
EXT.AUX.HEATER	Activates the function for external auxiliary heater and states how it should be configured. EXT.AUX.HEATER: Switch the external auxiliary heater off and on. Factory setting:  range:  - ON INTEGRAL A3: Indicates the value of the integral when external auxiliary heater is connected. Factory setting: -300, range: -990 - A1 - 10°min TURN OFF DELAY: Indicates how long the external auxiliary heater must continue to be active after its demand is no longer needed. Factory setting: 0M, range: 0M - 180M REV.V. HOT WATER: Indicates whether the reversing valve for hot water is located before or after the external auxiliary heater. (Determines whether the external auxiliary heater may produce hot water. Factory setting: INT, range: INT - EXT TOPH. EXT. Indicates whether the external auxiliary heater can be used for anti-legionella. The reversing valve must be positioned after the external auxiliary heater. Factory setting:  range:  - ON SHUNTIME EXT.: Indicates the shortest permitted interval between control signals to the shunt. Factory setting: 60S, range: 10S - 99S

8.6 MANUAL TEST

Parameter	Meaning
MANUAL TEST	0 = deactivate manual test 1 = activate manual test 2 = activate manual test with option of navigating from the SERVICE menu to check that the temperatures rise for example.
COMPRESSOR	0 = stop compressor 1 = start compressor

Parameter	Meaning
CIRC. PUMP SYSTEM	0 = stop circulation pump system 1 = start circulation pump system
CIRC. PUMP	0-10V for test of speed controlled circulation pump. Depending on type and number of connected circulation pumps, this parameter will contain different information. In the event of pumps with fixed speed, the selection 0 = stop and 1 = start are available
FAN	0-10V for test of the speed controlled fan
FOUR-WAY VALVE	0 = four way valve is set for heating 1 = four way valve is set for defrosting/cooling
EXPANSION VALVE	0 – 100% for test of electronic expansion valve.
SOLENOID	0 = closed solenoid 1 = open solenoid
COMPR.HE	0 = compressor heater off 1 = compressor heater on
DRIP TRAY	0 = drip tray heater off 1 = drip tray heater on
REV.V. HOT WATER	0 = reversing valve in heating mode 1 = reversing valve in hot water mode
AUX. HEAT 1	0 = stop of internal immersion heater power stage 1 1 = start of internal immersion heater power stage 1
AUX. HEAT 2	0 = stop of internal immersion heater power stage 2 1 = start of internal immersion heater power stage 2
AUX. HEAT 3	0 = stop of internal immersion heater power stage 3 1 = start of internal immersion heater power stage 3
EXT.AUX.HEATER	0 = stop external heat source (230V) 1 = start external heat source (230V)
POT.FREE	0 = potential free output for control of auxiliary heater open 1 = potential free output for control of auxiliary heater closed
CIRC. PUMP DiCi.1	0 = stop circulation pump in discharge circuit 1 1 = start circulation pump in discharge circuit 1
SHUNT DiCi.1	– = closes shunt in discharge circuit 1 0 = shunt unaffected + = opens shunt in discharge circuit 1
CIRC. PUMP DiCi.2	0 = stop circulation pump in discharge circuit 2 1 = start circulation pump in discharge circuit 2
SHUNT DiCi.2	– = closes shunt in discharge circuit 2 0 = shunt unaffected + = opens shunt in discharge circuit 2
SYSTEM SHUNT	– = closes shunt 0 = shunt unaffected + = opens shunt
RET.LINE HP SHUNT	– = closes return line shunt in systems with buffer tank 0 = shunt unaffected + = opens shunt in systems with buffer tank
REV. V. POOL	0 = reversing valve in normal mode 1 = reversing valve in pool mode
ALARM	0 = no voltage on output 201.6 External alarm 1 = 230V on output 201.6 External alarm
DIGITAL OUT	0 = no voltage on output 204.1 1 = 5V (2mA) on output 204.1

8.7 INSTALLATION

Parameter	Meaning
HEAT SOURCE	Selecting heat pump type for configuration of control. Outdoor air with direct evaporation and four-way valve.
POOL	Activates the pool function. Factory setting:  range:  – ON
DISTRIBUTION CIRCUIT 1 - 2	Activates the shunt group function and indicates if the shunt group is to be controlled by the heat curve or by a constant temperature. Factory setting:  range:  – HEAT CURVE – CONSTANT TEMP SHUNT TIME - Indicates the shortest permitted interval between control signals to the shunt. Factory setting: 60S, range: 10S – 99S
BUFFER TANK	Activates the buffer tank function. Factory setting:  range:  – ON
OPTIMUM	Activates the Optimum function, makes use of a speed controlled circulation pump possible. Factory setting:  range:  – ON
CURRENT LIMITER	Activates the current limiting function. An expansion card must be installed for current measurement. Factory setting:  range:  – ON
START UP CHECK	Activation of the function for checking temperature and pressure at compressor start. If deviations are found this is indicated by an alarm. Factory setting: ON, range:  – ON
SERVICE TIME	 Only used for test operation. The heat pump counts 60 times as fast, which means that the waiting times are eliminated during test operation. 0 = deactivates SERVICE TIME 1 = activates SERVICE TIME, which speeds up the control system's integral calculation and start delay by 60 times. Factory setting: 0, range 0 – 1
FACTORY SET	Indicates if resetting to factory settings must be done. CANCEL: Starting point, no changes made. RADIATOR: Reset factory settings for radiator system FLOOR: Reset factory settings for underfloor heating.
RESET OPER. TIME	Used to reset operating times. 0 = no reset of operating times 1 = reset of operating times to zero Factory setting: 0, range 0 – 1
SENSOR CALIBRATION	OUTDSYSTEM SUPPLYSUPPLY LINERETURN LINEHOT WATERHOT WATER TOPREFR 1 REFR 2 DISCH. PIPEDEFR SENSOR BUFFER TANK DISTRIBUTION CIRCUIT 1 DISTRIBUTION CIRCUIT 2 POOL SUCTION GAS Factory setting: 0, range: -5°C – 5°C EXTERNAL FACTOR: Affects sensors that are installed inside the heat pump. Factory setting: 0, range: 0°C – 20°C

Parameter	Meaning
VERSION	Indicates the version number of the software in the control. DISPLAYHUBHP (heat pump card) EXP (expansion card) EXV (expansion valve card)
LOG TIME	Time interval between collection points of temperature history in minutes. The history graphs always show the 60 last collection points, which means that the graphs can display history from 1 hour up to 60 hours ago. (The function is not active if there is an active alarm). Factory setting: 1M, range: 1M – 60M

8.8 DEFROST

Parameter	Meaning
DEFR OFFSET	Adjusting the defrost curve. Negative value moves the defrost curve down which means that it takes a longer time before defrosting starts. Positive value moves the defrost curve up which means that it takes a shorter time before defrosting starts. Factory setting: 0°C, range: -20°C – 20°C
STOP DEFR	The temperature that refrigerant sensor 2 must reach to complete a defrost. Factory setting: 38°C, range: 7°C – 60°C
BELOW 5°C DEFR	Safety defrosting occurs when the outdoor temperature has been below 5°C for a set number of days. Factory setting: 7D, range: 1D – 14D
MAX TIME DEFR	Longest permitted time for a defrost. Factory setting: 10M, range: 3M – 20M
MIN TIME DEFR	Shortest permitted time for a defrost. Factory setting: 3M, range: 0M – 5M
BETW. 2 DEFR	Indicates minimum time between two defrosts. Factory setting: 45M, range: 20M – 60M
MIN RAD STMP	Lowest permitted supply temperature on the heating circuit during defrost before electrical auxiliary heater starts. Factory setting: 20°C, range: 16°C – 30°C
FAN START	The fan starts when the temperature on refrigerant sensor 1 reaches the set value. If FAN START is set to ON, the fans starts and stops at the same time as the compressor and the FAN STOP parameter is inactive. Factory setting: 10°C, range: ON, -5°C – FAN STOP -3°C
FAN STOP	The fan stops when the temperature on refrigerant sensor 1 reaches the set value. Factory setting: 25°C, range: FAN START + 3°C – 30°C
FAN SPEED.	To control the fan speed. In AUTO mode the fan speed is controlled automatically depending on demand. At a setting between 60% – 100% the fan speed is locked in the set value. Factory setting: AUTO, range: AUTO, 60% – 100%
FAN MAX	Fan may increase speed to set value as maximum. The value can be lowered to reduce noise level at the cost of performance. Factory setting: Depending on compressor size, range: 6-7V – 8-9V
DEFR HP STOP	Defrosting is initiated earlier when heat pump is stopped. Factory setting: 5°C, range: 5°C – 7°C

8.9 OPTIMUM

Parameter	Meaning
TEMP DIFF CIRC.	Desired temperature difference between supply and return line for the heating system. Factory setting: 8°C, range: 0°C – 15°C, 
START FLOW CIRC.	Setting the speed a speed controlled circulation pump must start with. Check using MANUAL TEST -> CIRC. PUMP which speed gives sufficient flow. This is indicated by "F" in the display (flow sensor closed). The start flow is maintained one minute before control goes to speed control the circulation pump. Factory setting: 7V, range: 3V – 10V
CONST. FL. CIRC.	If TEMP DIFF CIRC. is set to  the flow is continuous with this value in the heating system. Value indicated in Volts. Factory setting: 7V, range: 3V – 10V
MIN FLOW CIRC.	Lowest permitted voltage (speed) of the circulation pump in the heating system. Factory setting: 3V, range: 3V – 10V
MAX H.W CHARGE HW	Highest supply temperature during water heating. Factory setting: 55°C, range: 45°C – 65°C
MIN CHARGE. HW	Lowest desired supply temperature during water heating. Factory setting: 50°C, range: 30°C – 65°C

8.10 BUFFER TANK

Parameter	Meaning
CONFIGURATION	With integral control, heating is produced according to the house's heating demand. With tank control, a fixed value is stated for the buffer tank. Factory setting: INTEGRAL CONTROL, range: INTEGRAL CONTROL – TANK CONTROL
RET. LINE. HP SHUNT	When the heat pump is inactive the heat is shunted from the buffer tank to the heat pump at set temperature. Factory setting: 25°C, range: 20°C – 30°C SHUNT TIME RET. Indicates shortest permitted time between control signals to the return line shunt. Factory setting: 30S, range: 10S – 99S
TANK HYST. HP	Indicates the number of degrees from the desired buffer tank temperature when the heat pump must start to heat the buffer tank. A condition is that CONFIGURATION = TANK CONTROL. Factory setting: 4°C, range: 2°C – 20°C
TANK HYST. IMM	Indicates the number of degrees from the desired buffer tank temperature when the immersion heater must start to heat the buffer tank. A condition is that CONFIGURATION = TANK CONTROL. Factory setting: 7°C, range: 2°C – 20°C
TANK HYST. EXT	Indicates the number of degrees from the desired buffer tank temperature when the external auxiliary heater must start to heat the buffer tank. A condition is that CONFIGURATION = TANK CONTROL. Factory setting: 10°C, range: 2°C – 20°C

Parameter	Meaning
SYSTEM CIRCUIT	Indicates if the system shunt group must be controlled by a heat curve or by a constant temperature. Conditions are that CONFIGURATION = TANK CONTROL and the external auxiliary heater is not configured. Factory setting: HEAT CURVE, range: HEAT CURVE – CONSTANT TEMP - OPEN CIRCUIT. At the selection OPEN CIRCUIT, the shunt outputs are not active, but the temperature for system supply is displayed in the OP.DATA menu. The menu only appears if external auxiliary heater is not selected. SHUNT TIME SYS. Indicates shortest permitted time between control signals to the system shunt. Factory setting: 60S, range: 10S – 99S SYS.PUMP COOL Indicates whether the system's circulation pump must be used for cooling. Not displayed if external auxiliary heater is selected. Factory setting: ON, range:  – ON
DISTRIBUTION CIRCUIT 1 - 2	Indicates if the shunt group must be controlled by a heat curve or by a constant temperature. Factory setting: HEAT CURVE, range: HEAT CURVE – CONSTANT TEMP - OPEN CIRCUIT. At the selection OPEN CIRCUIT, the shunt outputs are not active, but the temperature for shunt group is displayed in the OP.DATA menu. Open circuit cannot be used in connection with CONFIGURATION = TANK CONTROL or if external auxiliary heater is configured. The option  (OFF) deactivates the shunt group function fully. The menu only appears if SHUNT GROUP sensor is connected SHUNT TIME DC1 - 2 Indicates shortest permitted time between control signals to the shunt. Factory setting: 60S, range: 10S – 99S DISTR. 2 PUMP COOL Indicates whether the circulation pump for shunt group must be used for cooling. Factory setting: ON, range:  – ON
HEAT STOP DEPENDENT.	Indicates if heating the buffer tank is to be influenced by HEAT STOP. A condition is that CONFIGURATION = TANK CONTROL. Factory setting: YES, range: NO – YES
POOL CIRCUIT	Used to indicate where the reversing valve for pool is located. The system supply circuit cannot be used if external auxiliary heater is configured. Factory setting: SYSTEM SUPPLY, range: SYSTEM SUPPLY - DISTRIBUTION CIRCUIT 1 - DISTRIBUTION CIRCUIT 2 MAX TIME POOL determines the longest permitted pool heating time at non-integral controlled circuit. Factory setting: 40M, range 1M – 210M
MAX TANK TEMP	Maximum permitted temperature in the buffer tank. Fixed value 55°C is used if no external auxiliary heater is configured. At external auxiliary heater the temperature can be set between 55°C – 80°C. Factory setting: 55°C, range: 55°C – 80°C

9 Important information/Safety regulation

9.1 General safety precautions

Warning



Risk of personal injury! Children are not permitted to play with the product.

Caution



The heat pump must be installed by authorised installation engineers and the installation must follow the applicable local rules and regulations as well as these installation instructions.

Caution



This product is not intended for persons (including children) with reduced physical, sensory or psychological capacity, or who do not have knowledge or experience, unless supervised or they have received instructions on how the apparatus functions from a safety qualified person.

Caution



The heat pump must be located in a frost-free environment!

Caution



The heat pump must be placed in an area with a floor drain.

Caution



The heat pump must be located on a stable base. The floor must be able to support the gross weight of the heat pump with filled hot water tank (see Technical data).

Caution



To prevent leaks, ensure that there are no stresses in the connecting pipes!

Caution



It is important that the heating system is bled after installation.

Caution



Bleed valves must be installed where necessary.

Caution



The hot water tank must be equipped with an approved safety valve.

Caution



Heating systems with closed expansion tanks must also be supplied with approved pressure gauges and safety valves.

Caution



Cold and hot water pipes and overflow pipes from safety valves must be made of heat resistant and corrosion-resistant material, for example copper. The safety valve overflow pipes must have an open connection to the drain and visibly flow into this in a frost-free environment.

Caution



The connecting pipe between the expansion tank and the safety valve must slope continuously upwards. A continuous upwards slope means that the pipe must not slope downwards from the horizontal at any point.

Caution



When cooling it is important to limit the lowest flow line temperature to prevent condensation.



If there is any risk of groundwater infiltration at wall lead-ins for brine pipes, watertight grommets must be used.



In addition to applicable local rules and regulations the installation should be carried out in a manner that prevents vibrations from the heat pump being transmitted into the house causing noise.

9.2 Refrigerant

9.2.1 Refrigerant

Caution



Work on the refrigerant circuit must only be carried out by a certified engineer!

Although the heat pump cooling system (refrigerant circuit) is filled with a chlorine-free and environmentally-approved refrigerant that will not affect the ozone layer, work on this system may only be carried out by authorized persons.

9.2.2 Fire risk

The refrigerant is not combustible or explosive in normal conditions.

9.2.3 Toxicity

In normal use and normal conditions the refrigerant has low toxicity. However, although the toxicity of the refrigerant is low, it can cause injury (or be highly dangerous) in abnormal circumstances or where deliberately abused.

Warning



Risk of personal injury! Spaces in which heavy vapour can collect below the level of the air must be well ventilated.

Refrigerant vapour is heavier than air and, in enclosed spaces below the level of a door for example, and in the event of leakage, concentrations can arise with a resultant risk of suffocation due to a lack of oxygen.

Warning



Risk of personal injury! Refrigerant exposed to a naked flame creates a poisonous irritating gas. This gas can be detected by its odour even at concentrations below its permitted levels. Evacuate the area until it has been sufficiently ventilated.

9.2.4 Work on the refrigerant circuit

Caution



When repairing the refrigerant circuit, the refrigerant must not be released from the heat pump, it must be treated in the appropriate way.

Draining and refilling must only be carried out using new refrigerant (for the amount and type of refrigerant see manufacturer's plate) through the service valves.

Caution



All warranties from Thermia are void if, when filling with refrigerant other than Thermia Värme AB specified refrigerant, if there has not been written notification that the new refrigerant is an approved replacement refrigerant together with other remedies.

9.2.5 Scrapping

Caution



When the heat pump is to be scrapped the refrigerant must be extracted for disposal. Local rules and regulations related to the disposal of refrigerant must be followed.

9.3 Electrical connection

Warning



Hazardous electrical voltage! The terminal blocks are live and can be highly dangerous due to the risk of electric shock. All power supplies must be isolated before electrical installation is started. The heat pump is connected internally at the factory, for this reason electrical installation consists mainly of the connection of the power supply.

Caution



Electrical installation may only be carried out by an authorized electrician and must follow applicable local and national regulations.

Caution



The electrical installation must be carried out using permanently routed cables. It must be possible to isolate the power supply using an all-pole circuit breaker with a minimum contact gap of 3 mm. (The maximum load for externally connected units is 2A).

9.4 Water quality

Caution



A normal heating system always contains a certain amount of corrosion particulates (rust) and sludge products from calcium oxide. This comes from acid that is naturally occurring in the fresh water that the system is filled with. It is not good practice to have to fill the heating system regularly which is why any leakage in the heating system should be repaired immediately. Normal filling should occur only once or twice a year. The water in the heating system should be as clean as possible, always position the dirt filter on the return line from the heating system to the heat pump, as close to the heat pump as possible.

Caution



Hard water; Normally it is not a problem installing a heat pump in areas with hard water because the normal operating temperature for the hot water does not exceed 60°C. In areas where there are exceptional prevailing conditions with the water one can install a softening filter, which softens the water, cleans any impurities and prevents the build up of calcification.

9.5 Commissioning

Caution

The installation may only be commissioned if the heating system and brine system have been filled and bled. Otherwise the circulation pumps can be damaged.

Caution

If the installation is only to be driven by the immersion heater during the installation, ensure that the heating system is filled and the brine pump and compressor cannot be started. This is carried out by setting the operating mode to AUX. HEATER.



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